Pending Claims:

Please cancel claims 5, 31-37, and 46 and amend claims 1, 11, 17, 27, 38, and 47 as follows:

1. (Currently Amended) A bi-directional signal interface comprising:

a RF bi-directional signal port that transmits a RF transmission signal propagating as a first traveling wave in a first direction and that receives a RF reception signal propagating as a second traveling wave in a second direction;

a first waveguide having one end that is coupled to an input port that receives the RF transmission signal and having another end that is coupled to the RF bi-directional port ~~that receives the RF reception signal~~; and

a second waveguide positioned proximate to the first waveguide to form a non-reciprocal waveguide device where coupling between the first waveguide and the second waveguide is a function of direction of propagation of traveling waves through the non-reciprocal waveguide device and having an input port that is coupled to an output of a source that generates a third traveling wave ~~at the output~~ and an output port, the second waveguide propagating the third traveling wave in the second direction,

wherein the RF reception signal propagating as the second traveling wave in the first waveguide propagates in the same direction as the third traveling wave propagating in the second direction in the second waveguide such that at least a portion of the received RF reception signal couples from the first waveguide to the second waveguide, and the RF transmission signal propagating as the first traveling wave in the first waveguide propagates in an opposite direction to the third traveling wave propagating in the second direction in the second waveguide, thereby substantially preventing the RF transmission signal from coupling to the second waveguide, and passing substantially all of the RF transmission signal through the first waveguide to the RF bi-directional port.

2. (Original) The signal interface of claim 1 wherein substantially all of the RF transmission signal from the RF input port passes through the first waveguide to the RF bi-directional port.

3. (Previously Presented) The signal interface of claim 1 wherein substantially all of the RF reception signal from the RF bi-directional port couples from the first waveguide to the second waveguide in a substantially non-reciprocal manner.

4. (Original) The signal interface of claim 1 wherein the first and the second waveguides comprise an electro-optic modulator.

5. Canceled.

6. (Previously Presented) The signal interface of claim 1 wherein the non-reciprocal waveguide device comprises an electrode structure that velocity matches at least one of the RF reception signal and the RF transmission signal to at least one of the first and the second traveling wave.

7. (Original) The signal interface of claim 1 wherein the RF bi-directional port receives the RF reception signal and passes the RF transmission signal with full duplex operation.

8. (Original) The signal interface of claim 1 wherein the RF bi-directional port receives the RF reception signal and passes the RF transmission signal with half-duplex operation.

9. (Original) The signal interface of claim 1 further comprising a photodetector having an optical input that receives an optical transmission signal and an electrical output that is connected to the RF input port, the photodetector converting the received optical transmission signal to the RF transmission signal at the electrical output.

10. (Original) The signal interface of claim 1 further comprising an antenna that is electrically connected to the RF bi-directional port.

11. (Currently Amended) A method of interfacing a reception signal and a transmission signal, the method comprising:

> propagating a traveling-wave RF transmission signal from an input port through a first waveguide in a first direction to a bi-directional port without coupling a significant portion of the traveling-wave RF transmission signal to a second waveguide <u>that is positioned proximate to the first waveguide so as to form a non-reciprocal waveguide</u>

device where coupling between the first waveguide and the second waveguide is a function of direction of propagation of traveling waves through the non-reciprocal waveguide device;

propagating a traveling-wave RF reception signal in a second direction from the bi-directional port to the first waveguide;

propagating a traveling wave signal in the second waveguide in the second direction;

coupling a portion of the traveling-wave RF reception signal propagating in the second direction from the first waveguide to the second waveguide in a substantially non-reciprocal manner; and

propagating the traveling-wave RF reception signal in the second direction from the second waveguide to an output port.

12. (Original) The method of claim 11 wherein the coupling the RF reception signal comprises coupling substantially all of the RF reception signal from the first waveguide to the second waveguide.

13. (Original) The method of claim 11 wherein the RF reception signal is received from an antenna.

14. (Original) The method of claim 11 wherein the first and the second traveling waves have fields that are substantially velocity matched to at least one of the RF reception signal and the RF transmission signal.

15. (Original) The method of claim 11 wherein the propagating the RF reception signal from the bi-directional port and the propagating the RF transmission signal through the first waveguide to the bi-directional port are performed substantially simultaneously in time.

16. (Original) The method of claim 11 further comprising converting a received optical transmission signal to the RF transmission signal.

17. (Currently Amended) An electro-optic bi-directional signal interface comprising: ~~an~~

~~electro-optic modulator: having an optical input that receives an optical beam, a RF input port that receives a RF transmission signal, a RF bi-directional port that receives a RF reception signal and that transmits the RF transmission signal, and an optical output port, the electro-optic modulator generating an optical signal that is modulated by the RF reception signal at the optical output port and passing the RF transmission signal to the RF bi-directional port.~~

a RF bi-directional signal port that transmits a RF transmission signal propagating as a first traveling wave in a first direction and that receives a RF reception signal propagating as a second traveling wave in a second direction;

an electrical waveguide having a RF input port at one end that receives the RF transmission signal propagating as the first traveling wave in the first direction and having another end that is coupled to the RF bi-directional signal;

an optical waveguide having an optical input that receives an optical beam propagating as a third traveling wave in the second direction and that is positioned proximate to the electrical waveguide to form an electro-optic modulator configured as a non-reciprocal waveguide device where coupling between the electrical waveguide and the optical waveguide is a function of direction of propagation of traveling waves through the non-reciprocal waveguide device,

wherein the RF reception signal propagating as the second traveling wave in the electrical waveguide propagates in the same direction as the optical beam propagating as the third traveling wave in the second direction such that at least a portion of the received RF reception signal couples from the electrical waveguide to the optical waveguide, thereby modulating the optical beam with the RF reception signal, and the RF transmission signal propagating as the first traveling wave in the electrical waveguide propagates in an opposite direction to the optical beam propagating as the third traveling wave in the second direction in the second waveguide, thereby substantially preventing the RF transmission signal from coupling to the optical waveguide, and passing substantially all of the RF transmission signal through the electrical waveguide to the RF bi-directional port.

18. (Original) The signal interface of claim 17 wherein the optical beam comprises a continuous wave optical beam.

19. (Original) The signal interface of claim 17 wherein the optical beam comprises a pulsed optical beam.

20. (Original) The signal interface of claim 17 wherein the electro-optic modulator comprises a Mach-Zehnder interferometric modulator.

21. (Original) The signal interface of claim 17 wherein the electro-optic modulator comprises an electrode structure that velocity matches the RF reception signal to an optical field of the optical beam.

22. (Original) The signal interface of claim 17 further comprising a photodetector having an optical input that receives an optical transmission signal and an electrical output that is connected to the RF input port, the photodetector converting the received optical transmission signal to the RF transmission signal at the electrical output.

23. (Original) The signal interface of claim 22 further comprising an amplifier having an input that is electrically connected to the output of the photodetector and an output that is electrically connected to the RF input port, the amplifier electrically amplifying the RF transmission signal.

24. (Original) The signal interface of claim 17 wherein the RF bi-directional port receives the RF reception signal and passes the RF transmission signal substantially simultaneously in time.

25. (Original) The signal interface of claim 17 further comprising an antenna that is electrically connected to the bi-directional port.

26. (Original) The signal interface of claim 17 wherein the RF input port is terminated with a resistance in order to reduce a noise figure associated with a system using the signal interface.

27. (Currently Amended) A method of transmitting and receiving signals, the method comprising:

receiving a RF transmission signal at a RF input port and propagating a traveling-wave

RF transmission signal through a first waveguide in a first direction;

receiving a RF reception signal at a RF bi-directional port and propagating a traveling-wave RF reception signal through the first waveguide in a second direction;

generating an optical beam;

propagating the optical beam in a second waveguide that is positioned proximate to the first waveguide so as to form a non-reciprocal waveguide device where coupling between the first waveguide and the second waveguide is a function of direction of propagation of traveling waves through the non-reciprocal waveguide device and having one end that is coupled to an output port, the optical beam propagating as a third traveling wave in the second direction;

modulating the optical beam with the traveling-wave RF reception signal propagating in the second direction and passing the modulated optical beam to the output port; and

passing the traveling-wave RF transmission signal propagating through the first waveguide in the first direction to the RF bi-directional port.

28. (Original) The method of claim 27 wherein the receiving the RF reception signal at the RF input port and the passing the RF transmission signal to the RF bi-directional port are performed substantially simultaneously in time.

29. (Original) The method of claim 27 further comprising velocity matching the received RF reception signal to an optical field of the optical beam.

30. (Original) The method of claim 27 further comprising generating the RF transmission signal with an optical transmission signal that is generated by an optical data signal source.

31. Canceled.

32. Canceled.

33. Canceled.

34. Canceled.

35. Canceled.

36. Canceled.

37. Canceled.

38. (Currently Amended) A transceiver comprising:

an antenna that receives a RF reception signal and that transmits a RF transmission signal;

a laser that generates an optical beam at an output; and

an electro-optic modulator ~~modulator~~ comprising: ~~an optical input port that is optically coupled to the output of the laser, a RF input port, and~~

a RF bi-directional port that is electrically connected to the antenna,

an electrical waveguide having an RF input port that receives the RF transmission signal;

an optical waveguide having an optical input port that is optically coupled to the output of the laser~~,~~ and that is positioned proximate to the electrical waveguide so as to form an electro-optic non-reciprocal waveguide device where coupling between the electrical waveguide and the optical waveguide is a function of direction of propagation through the electro-optic non-reciprocal waveguide device,

~~the electro-optic modulator receiving the optical beam from the laser, the RF reception signal from the antenna, and a RF transmission signal at~~ from ~~the RF input port,~~

wherein the electro-optic modulator generates~~ing~~ an optical signal that is modulated by the RF reception signal at an optical output port and transmits~~ing~~ the RF transmission signal from the RF input port to ~~with~~ the antenna.

39. (Original) The transceiver of claim 38 wherein the electro-optic modulator comprises a Mach-Zehnder interferometric modulator.

40. (Original) The transceiver of claim 38 wherein the electro-optic modulator comprises an electrode structure that velocity matches the RF reception signal with an optical field of the optical beam.

41. (Original) The transceiver of claim 38 wherein the RF bi-directional port of the electro-optic modulator receives the RF reception signal from the antenna and passes the RF transmission signal to the antenna simultaneously in time.

42. (Original) The transceiver of claim 38 further comprising a photodetector having an optical input that receives an optical transmission signal from an optical data source and an output that is electrically connected to the RF input port of the electro-optic modulator, the photodetector converting the received optical transmission signal to the RF transmission signal at the electrical output.

43. (Original) The transceiver of claim 42 further comprising an amplifier having an electrical input that is connected to the output of the photodetector and an electrical output that is connected to the RF input port of the electro-optic modulator, the amplifier electrically amplifying the RF transmission signal.

44. (Original) The transceiver of claim 38 further comprising a demodulator that is coupled to the optical output of the electro-optic modulator, the demodulator demodulating the RF reception signal.

45. (Original) The transceiver of claim 42 further comprising the optical data source that generates the optical transmission signal.

46. Canceled.

47. (Currently Amended) A bi-directional signal interface comprising:

means for propagating a traveling-wave transmission signal in a first direction through a first waveguide without coupling a significant portion of the traveling-wave transmission

signal to a second waveguide that is positioned proximate to the first waveguide so as to form a non-reciprocal waveguide device where coupling between the first waveguide and the second waveguide is a function of direction of propagation of traveling waves through the non-reciprocal waveguide device;

means for propagating a third traveling-wave signal in the second waveguide in the second direction; and

means for coupling a traveling-wave reception signal propagating in the second direction from the first waveguide to the second waveguide~~; and~~ by modulating the third traveling wave.

~~means for propagating the traveling-wave reception signal in the second direction through the second waveguide to an output port.~~

48. (Original) The signal interface of claim 1 wherein the input port transmits a portion of the RF reception signal propagating the second traveling wave in the second direction.